

## WHAT IS CLAIMED IS:

1. A light emitting die package comprising:  
a stem substrate having a first end surface and a second end surface, said stem substrate defining at least one groove;  
a wire lead running along the groove of said stem substrate, the wire lead terminating at the first end surface;  
and  
a light emitting diode (LED) mounted on the first end surface, the LED making electrical and thermal contact with said stem substrate, the LED also connected to the wire lead.
2. The light emitting die package recited in claim 1 wherein said stem substrate comprises electrically and thermally conductive material.
3. The light emitting die package recited in claim 1 wherein said wire lead is positioned within the groove but electrically insulated from the stem substrate by wire lead insulation.
4. The light emitting die package recited in claim 3 wherein a portion of the wire lead insulation is stripped exposing a portion of the lead wire.
5. The light emitting die package recited in claim 1 further comprising a sleeve surrounding said stem substrate proximal to the first end surface, said sleeve defining an opening at the first end surface.

6. The light emitting die package recited in claim 5 wherein said sleeve defines a ledge adapted to couple a lens that, when mounted on the ledge, aligns the lens with lights from said LED.
7. The light emitting die package recited in claim 5 further comprising a lens coupled to said sleeve, said lens adapted for optical imaging function.
8. The light emitting die package recited in claim 7 wherein said lens includes a bottom surface coated with material for operating on light generated by the LED.
9. The light emitting die package recited in claim 7 wherein the lens encloses the opening thereby forming a cavity, the cavity at least partially filled by encapsulating material.
10. The light emitting die package recited in claim 5 wherein the opening is filled with encapsulant and capped with a lens movably coupled to said sleeve on the encapsulant.
11. The light emitting die package recited in claim 5 wherein said wire lead is positioned within the groove but electrically insulated from the stem substrate by wire lead insulation.
12. The light emitting die package recited in claim 11 wherein a portion of the wire lead insulation is stripped exposing a portion of the lead wire.

13. The light emitting die package recited in claim 5 further comprising a reflector coupled to said sleeve, said reflector surrounding the opening and is adapted to reflect light from the LED.
14. The light emitting die package recited in claim 5 wherein said sleeve includes an integrated reflector surface.
15. The light emitting die package recited in claim 1 wherein the LED is connected to the wire lead using a connection selected from a group consisting of bond wire, solder, and ball-grid-array connection.
16. A light emitting die package array comprising:
  - an array housing including an external heatsink and reflector bowl, said array housing defining die package spaces;
  - a plurality of light emitting die packages mounted in the die package spaces, each light emitting die comprising:
    - a stem substrate having a first end surface and a second end surface, said stem substrate defining at least one groove;
    - a wire lead mounted on the groove of said stem substrate, the wire lead terminating at the first end surface; and
    - a light emitting diode (LED) mounted on the first end surface making electrical and thermal contact with said stem substrate, the LED also connected to the wire lead.
17. The light emitting die package array recited in claim 16 wherein the external heat sink is thermally connected to the mounted light emitting die packages.

18. The light emitting die package array recited in claim 16 wherein, for each light emitting die package, said wire lead is positioned within the groove but electrically insulated from the stem substrate by wire lead insulation.
19. The light emitting die package array recited in claim 16 wherein each light emitting die package further comprises a sleeve surrounding said stem substrate proximal to the first end surface, said sleeve defining an opening at the first end surface.
20. The light emitting die package array recited in claim 19 wherein each light emitting die package further comprises a reflector coupled to said sleeve, said reflector surrounding the first end surface.
21. The light emitting die package array recited in claim 16 wherein each light emitting die package further comprises a lens coupled to said sleeve, said lens covering the opening.
22. A method of manufacturing a light emitting die package, the method comprising:
  - fabricating a stem substrate rod having a predetermined length, the stem substrate rod defining at least one groove;
  - attaching wire lead on the groove of the stem substrate rod;
  - cutting the stem substrate rod including the attached wire leads to a predetermined length thereby forming an individual stem substrate;

planarizing a first end surface of the individual stem substrate; and

mounting a light emitting diode (LED) on the first end surface, the LED making electrical and thermal contact with the stem substrate, the LED also connected to the wire lead.

23. The method recited in claim 22 further comprising encapsulating the LED.
24. The method recited in claim 22 further comprising attaching a sleeve surrounding the stem substrate proximal to the first end surface, the sleeve defining an opening at the first end surface.
25. The method recited in claim 24 further comprising coupling a reflector on the sleeve, the reflector surrounding the opening.
26. The method recited in claim 24 further comprising coupling a lens to the sleeve, the lens covering the opening.